

Serial No.: 09/824,332 Filed: 4/2/2001  
Amendment dated: April 5, 2004  
Reply to Office Action of: 2/2/2004  
Atty. Docket No.:MAC-0113

### **REMARKS**

The preamble to Claims 1 and 20 have been amended to state that the atomization apparatus disclosed therein is used in a fluidized catalytic cracking unit. Support for this amendment can be found in paragraphs [004] through [008], [0026], lines 23-26, and paragraph [0027].

Claim 41 has been amended to state that the nozzle apparatus disclosed therein is used in a fluidized catalytic cracking unit. Support for this amendment can be found in paragraphs [004] through [008], [0026], lines 23-26, and paragraph [0027].

Applicants request that the Examiner enter all amended claims in order to place this application in condition for allowance or in better form for appeal.

### **REJECTION UNDER 35 U.S.C. 103**

Claims 15, 18-23, 25, 37-38, 40-50, 52, 53 and 55 have been rejected under 35 U.S.C. 103(a) as being obvious in light of United States Patent Number 4,931,171, Piotter ("Piotter").

### **EXAMINER'S POSITION**

The Examiner takes the position that Piotter obviates the presently claimed invention. In particular, the Examiner points to Figure 6 of Piotter and col. 18, line 31 to column 19, line 31. In particular, the Examiner states that this section of Piotter discloses an apparatus comprising a central passageway; an atomization zone; a plurality of atomization fluid passageways fluidly communicating with the central passageway via atomization fluid passageway outlets positioned concentrically about a perimeter of the central passageway. The Examiner continues that the apparatus of Piotter includes a heating zone, a mixing zone comprising a first inlet for a fluid to be atomized and a second inlet positioned upstream of said central passageway, and a stream splitter similar to the present invention.

The Examiner notes that although air is used as the atomization fluid in the embodiment on Figure 6 of Piotter, the specification of Piotter suggests that steam can be used as an equivalent to air in an alternate embodiment at col. 13, lines 7-12.

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The Examiner continues that in any event, the apparatus of Piotter meets the limitations of the present claims.

#### APPLICANTS' POSITION

It is applicants' position that one having ordinary skill in the art and knowledge of Piotter at the time the invention was made would not have found it obvious to arrive at the presently claimed invention.

As amended the present invention is an apparatus, or nozzle in the case of claim 41, used in a fluidized catalytic cracking unit("FCCU") for atomizing a fluid. The apparatus comprises a central passageway for allowing the fluid to be atomized to pass through and an atomization zone positioned downstream from the central passageway. The apparatus also comprises a plurality of atomization fluid passageways configured to communicate with the central passageway via atomization fluid passage outlets. The presently claimed apparatus further comprises a heating zone and a mixing zone. The mixing zone comprises a first inlet to receive the fluid to be atomized and a second inlet positioned upstream of the first inlet. The second inlet is a sparger comprised of a cylindrical conduit containing a plurality of sparger fluid passageways to allow the passage of sparger fluid into the mixing zone.

At col. 18, line 31 to line 37, Piotter discloses "another combustor that can be used in accordance with the present invention. The apparatus of Figure 6 is designed for the use of a normally gaseous fuel. The apparatus basically comprises a mixing zone 200, a combustion zone 202, a quench or cooling chamber 204 and a discharge nozzle 206." Column 18 continues that air is introduced into the mixing zone through any means known to create a swirling annular flow of air. The mixture exiting the mixing zone of Piotter is only partially mixed, and then passed through barrier means 212, a perforated grid, to create a stratified body of fluids. Grid 212 further serves as a heat absorber and flash-back prevention device along with increasing the flow velocity. The fuel is ignited by spark-plug 214.

One having ordinary skill in the art and knowledge of Piotter would not have found it obvious to arrive at the present invention. The apparatus in Figure 6 of Piotter is one that is

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designed to be used in the combustion of a gaseous fuel, and is hence describe as a device used in a pyrolysis process. However, as amended, the present invention is one designed for use in an FCCU. One having ordinary skill in the art would not have found it obvious to utilize a device sufficient for causing combustion of a gaseous fuel in an FCCU.

The Examiner has also stated that Piotter suggests that the apparatus in Figure 6 therein meets the present claims since selection of air or steam is merely a matter of intended use and the apparatus is capable of utilizing either gaseous fluid. The Examiner points to col. 13, lines 7-13 of Piotter for support of this contention.

Applicants respectfully disagree with the Examiner. Column 13, lines 7-13 of Piotter states "However, the nozzle may be any variety of spray nozzles or fluid assist nozzles, such as an air assist or steam assist nozzle." Applicants submit that this section of the application must first be taken in the context in which it is written. Column 13, lines 2-7 provide context to this statement. This section of Piotter states that "in the particular instance schematically shown herein, the fuel introduction means 128 is an atomizing nozzle adapted for the introduction of a liquid fuel. Such atomizing nozzles are well known in the art and the details thereof need not be described herein." Thus, this section of Piotter is referring to the particular means that can be used to introduce the fuel that is to be combusted in the Piotter process. Thus, while the Examiner contends that the apparatus of Piotter can structurally accommodate steam, there is no suggestion in Piotter that it can do so. As stated above, Figure 6 of Piotter shows air being mixed with the fuel and introduced through a grid into a combustion zone. Column 5, lines 37-42 clearly state that the air used in this Figure is a combustion supporting material, and clearly states that this combustion supporting material must have sufficient oxygen for combustion of the fuel and "includes materials such as oxygen, air, oxygen-enriched air, and other oxygen containing materials." Thus, applicants again submit that there is no suggestion in Piotter that the apparatus disclosed in Figure 6 therein is capable of receiving steam to be mixed with the fuel. Further, applicants again submit that one having ordinary skill in the art would not view steam as a

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combustion supporting material, and therefore would not be taught to utilize it in the Piotter invention.

Further, one having knowledge of the above disclosure of Piotter would not be taught an atomization zone having a plurality of atomization fluid passageways, comprising steam, as is presently claimed. To the contrary, applicants submit that given the nature of the end sought in Piotter, i.e. the pyrolysis of a gaseous fuel, one would not be taught to utilize steam within the Piotter combustion process. One having ordinary skill in the art would not utilize a fire retardant, i.e. the water in the steam, in a process designed to combust a fuel.

The Examiner also states that Piotter includes disclosure that the "heat conductive apparatus or body" would inherently function as a "steam superheater" depending on the choice of atomizing fluid and the relative temperatures of the incoming fluid and feed streams. Applicants respectfully disagree. As stated above, there is no suggestion in Piotter to utilize steam, and one having ordinary skill in the art would not have found it obvious to utilize steam in a combustion device as the combustion supporting material. Thus, one would not be taught to include within the Piotter apparatus a heating zone to superheat steam.

Further, the fact that the apparatus of Piotter must comprise a heat conductive apparatus or body can hardly be said to obviate a heating zone to superheat steam, as is claimed in the present invention. It can likewise hardly be said that the fact that the apparatus of Piotter must comprise a heat conductive apparatus or body obviates a heating zone located upstream from the atomization zone. There is neither disclosure nor teaching in Piotter to include a heating zone anywhere within the invention of Piotter. Applicants respectfully submit that the Examiner is attempting to use hindsight to read into the invention of Piotter functional attributes of the elements therein that are neither taught nor disclosed by Piotter.

Thus, in conclusion, applicants respectfully disagree with the Examiner that Piotter obviates the presently claimed invention. As stated above, Piotter discloses a device that is used in the pyrolysis of a normally gaseous fuel. The present invention as amended, however, is an apparatus that is used within a fluidized catalytic cracking unit. Further, Piotter fails to disclose a

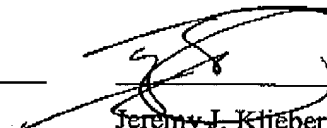
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plurality of atomization fluid passageways comprising steam. To the contrary, Piotter teaches away from the use of steam as Piotter plainly states that the fuel must be mixed with a combustion supporting material, and one having ordinary skill in the art would not recognize steam as a combustion supporting material. Further still, Piotter fails to disclose yet another element of the present invention, namely a heating zone to superheat steam.

Based on the preceding arguments and amendments, the Examiner is requested to reconsider and withdraw all rejections and pass this application to allowance. The Examiner is encouraged to contact applicants' attorney should the Examiner wish to discuss this application further.

Respectfully submitted:

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